**http://easycalculation.com/physics/classical-physics/images/newton-grav.gifNewton's Law:**  
     Newton's Law of Gravity states that 'Every particle attracts every other particle with a force that is proportional to the product of their masses and inversely proportional to the distance between them.  
  
**Newton's Law of Gravity Formula:**

Gravitational Force:

http://easycalculation.com/physics/classical-physics/images/newton-mass1.gif

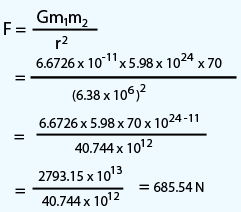
Mass of Object 1:

http://easycalculation.com/physics/classical-physics/images/newton-mass2.gif

Mass of Object 2:

http://easycalculation.com/physics/classical-physics/images/newton-dist.gif

Distance Between the Objects:

where,  
G = Universal Gravitational Constant = 6.6726 x 10-11N-m2/kg2  
m1 = Mass of Object 1  
m2 = Mass of Object 2  
r = Distance Between the Objects.  
  
**Newton's Law of Gravity Examples**:  
Case 1: Determine the force of gravitational attraction between the earth 5.98 x 1024 kg and a 70 kg boy who is standing at sea level, a distance of 6.38 x 106 m from earth's center.   
 m1 = 5.98 x 1024 kg, m1 = 70 kg, r = 6.38 x 106 m, G = 6.6726 x 10-11N-m2/kg2  
  Step 1: Substitute the values in the below Gravitational Force formula:  
              
This example will guide you to calculate the Gravitational Force manually.  
  
Case 2: Find the mass of one object if the magnitude of the gravitational force acting on each particle is 2 x 10-8, the one mass is 25 kg and the objects are 1.2 meters apart  
 F = 2 x 10-8, m2 = 25 kg, r = 1.2 m, G = 6.6726 x 10-11N-m2/kg2.  
  Step 1: Substitute the values in the below Mass formula:  
            